FIRST ANNUAL INTERIM PERFORMANCE REPORT FOR MARYLAND'S LANDOWNER INCENTIVE PROGRAM TIER 2 GRANT (I-2-HM-1)

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June 2007

GRANT TITLE: Maryland Landowner Incentive Program, Tier 2: Habitat Restoration and Enhancement for Species and Habitats at Risk

GRANT PERIOD: March 1, 2006 – June 30, 2011.

SUMMARY OF WORK CONDUCTED UP TO JUNE 2007

From March, 2006 to June, 2007 Maryland's Landowner Incentive Program has provided on-site technical assistance to 60 landowners, resulting in approval of 29 habitat restoration projects on private lands. Of these 29 approved projects, 22 have signed landowner agreements and 7 are set to go pending landowner signatures as project details are finalized. There are currently 12 potential projects on hold awaiting landowner decisions and 8 applications in the review process. A total of 24 projects were not funded after either preliminary consultation, or a formal review, determined that there would be insufficient benefit to species at risk.

The 29 landowners with approved LIP projects together own 9,717 acres of land, approximately 1,883 of which will be restored through LIP funding. There are records of 121 species at risk on these properties, 69 of them are targeted to benefit through LIP projects. Table 1 summarizes each project: the habitat type targeted, the practices used, the number of species to benefit, and the cost. Some projects target rare habitat types themselves, which will be explained further in the summaries for each target habitat. Also note that the totals for species documented and targeted do not add up because some species are found and/or targeted on more than one property. A full list of all species to benefit from these projects can be found in Appendix 1. The total amount of LIP expenditures for these projects is $515,705.35. We have documented $36,757.76 in cash and in-kind matching funds required under the landowner agreements. This is approximately 20% of the total amount required, which is on schedule as most projects are carried out over 5-year terms.

Table 1: Maryland LIP projects as of June 2007

Project Name	Habitat type	Total # acres	# acres to be restored	# species at risk documented on property	# species at risk to benefit	Practice(s)	LIP expenditures (does not include match)
American Chestnut Land Trust	Coastal Plain Mature Forest	786	786	10	4	Invasive species control	$33,413.00
Behnke's Nursery	Patuxent Microdesert	125	25	3	1	Invasive species control; restoration of native plant community	$20,000.00
Broad Creek Memorial Scout Reservation	Mountain Mature Forest	1,686	60	7	6	Invasive species control (hemlock woolly adelgid [HWA])	$11,485.00

Project Name	Habitat type	Total # acres	# acres to be restored	# species at risk documented on property	# species at risk to benefit	Practice(s)	LIP expenditures (does not include match)
Carney	Fen/Seepage Wetland	45.5	15	5	1	Fencing, livestock grazing in bog turtle wetlands	$12,515.00
Central Maryland Audubon	Mountain Mature Forest	130	4	0	0	Reforestation (contiguous forest)	$3,000.00
Cove Point Natural Heritage Trust	Coastal Plain Mature Forest	50	50	0	0	Invasive species control (plant and HWA)	$7,823.00
Denner	Fen/Seepage Wetland	5	1.8	1	1	Invasive species control	$1,600.00
Dewling	Beach	1	<1	0	1	Invasive species control	$1,000.00
Drum Point Project, Inc.	Beach	17	1	1	1	Invasive species control	$5,000.00
Felsen	Beach	1	<1	0	1	Invasive species control	$1,000.00
Gibson	Beach	1	<1	0	1	Invasive species control	$1,000.00
Gribble	Beach	2	<1	0	1	Invasive species control	$1,000.00
Jean Ellen Shehan Dupont Audubon Center	Grassland; non-tidal emergent wetland	948	200	22	22	Grassland establishment, grass and forest buffer establishment, restoration of wetland hydrology, vegetation management	$150,000.00
Lee	Beach	1	<1	0	1	Invasive species control	$1,000.00
Koste	Coastal Plain Mature Forest	164	25.5	1	0	Invasive species control (HWA), reforestation (contiguous forest)	$9,981.70
Malkus	Coastal Plain Mature Forest	288	8	1	1	Reforestation	$4,407.58
McDowell & Boyer	Mountain Mature Forest	71	7.5	1	0	Invasive species control, restoration of native plant community	$5,762.00
Pickering Creek Audubon	Coastal Plain Mature Forest	410	2	1	0	Invasive species control (HWA)	$4,000.00
Rock Lodge Trust	Mountain Mature Forest, Grassland	3,157	25	12	2	Invasive species control, establishment of warm-season grassland	$17,000.00
Rogers	Mountain Mature Forest, Grassland	205	39	12	12	Reforestation, establishment of warm-season grassland	$26,400.00
Sylvan View Community Association	Fen/Seepage Wetland	7	7	3	3	Restoration of wetland hydrology, restoration of native plant communities, fencing	$72,849.95
Seitz	Fen/Seepage Wetland	25	5	2	1	Fencing, livestock grazing in bog turtle wetlands	$12,117.50

Project Name	Habitat type	Total # acres	# acres to be restored	# species at risk documented on property	# species at risk to benefit	Practice(s)	LIP expenditures (does not include match)
The Nature Conservancy – Hellen Creek	Coastal Plain Mature Forest	64	9	3	0	Invasive species control (HWA)	$12,000.00
The Nature Conservancy – Jackson Lane	Groundwater Interfacing Wetlands	330	330	11	9	Invasive species control	$20,063.00
The Nature Conservancy – Licking Creek	Mountain Mature Forest	75	6	17	2	Invasive species control (HWA)	$9,652.50
The Nature Conservancy – Prescribed Burn	Groundwater Interfacing Wetland, Xeric Sand Ridge, Serpentine Barren	317	217	29	22	Vegetation management (prescribed burning)	$36,980.00
Weitzell	Mountain Mature Forest	750	25	3	1	Invasive species control	$5,655.00
Zeiller	Beach	1	<1	0	1	Invasive species control	$1,000.00
Zodhiates	Fen/Seepage Wetland, Ridge and Valley Stream	55	33.5	1	2	Reforestation, restoration of hydrology, invasive species control	$28,000.00
TOTALS:		**9,717**	**1,883.3**	**121**	**69**		**$515,705.35**

SUMMARY OF OBJECTIVES AND PROGRESS SO FAR

The following summarizes our original objectives, by habitat type, for Maryland Tier 2 funds, and our progress towards these goals. In most cases where our objectives have not been achieved, the reason is simply the short period of time that has passed since the beginning of the grant period. Where there are additional reasons, these are noted.

Project A. Restoration of Ridge and Valley, Piedmont, and Coastal Plain Stream Systems

Objective: To provide technical and financial assistance to landowners to restore water quality and riparian habitats of stream systems using the following practices:

Practice	GOAL	PROJECTED COST	PROGESS TO DATE	ACTUAL COST
Reforestation: Forested Buffer	150 acres	$150,000	25 acres	$14,400
Grassland Buffers	75 acres	$30,000	0	0
Invasive Species Control	50 acres	$25,000	8.5 acres	$13,600
Livestock Exclusion & Fencing	5000 ft	$15,000	0	0
	TOTAL:	$220,000	0	$28,000

It is important to note that 3 of our projects not included in the above tally actually benefit stream species via the maintenance of Mountain Mature Forest. They target four fish species and 2 mollusc species at risk: comely shiner, logperch, shield darter, brook trout, green floater and squawfoot. These projects involve treatment of the invasive insect, hemlock woolly adelgid, to prevent death of hemlock trees and subsequent loss of stream shading and increased erosion (Broad Creek Memorial Scout Reservation and The Nature Conservancy – Licking Creek).

We have forged a number of partnerships with the goal of restoring more stream habitat. For example, we have partnered with The Nature Conservancy to hold a landowner workshop in the Nanjemoy Creek Area, attended by over 80 local landowners, to talk about options for conservation on private land, including LIP. We have also worked with the Chesapeake Bay Trust (CBT) and are currently reviewing two projects involving stream bank buffer plantings on the Port Tobacco and Potomac Rivers for which match funding will come from CBT Targeted Watershed Grants. We are also partnering with Watershed Services within our own agency to identify landowners contacted through their Corsica River Initiative who could benefit from LIP funds in order to establish stream buffers.

Project B. Restoration of Shale Barrens and Glades

Objective: To provide technical and financial assistance to landowners to restore shale barrens and glades by controlling invasive and woody plant species and restricting livestock access to these sensitive habitats. To accomplish this objective we will use the following practices:

Practice	GOAL	PROJECTED COST	PROGESS TO DATE	ACTUAL COST
Invasive Species Control	50 acres	$25,000	0	0
Vegetation Management: Early-successional habitat	15 acres	$6,750	0	0
Livestock Exclusion & Fencing	1000 ft	$3,000	0	0
	TOTAL:	$34,750		0

Although we have not successfully initiated a shale barren project, we have provided technical assistance to one landowner with a remnant of shale barren on their property.

Project C: Restoration of Cliffs and Sandstone Outcrops

Objective: To provide technical and financial assistance to landowners in the restoration of native forest habitats on cliffs and sandstone outcrops using the following practices:

Practice	GOAL	PROJECTED COST	PROGESS TO DATE	ACTUAL COST
Invasive Species Control	20 acres	$10,000	0	0
Reforestation: Contiguous Forest	40 acres	$40,000	0	0
	TOTAL:	**$50,000**		0

We will begin outreach efforts to elicit the interest of landowners with high-quality cliffs or sandstone outcrops soon.

Project D. Restoration of Mountain Mature Forest

Objective: To provide technical and financial assistance to landowners to restore forests, reduce fragmentation, and control invasive species in the Ridge and Valley and Allegheny Plateau regions of Maryland. Specific practices and costs are as follows:

Practice	GOAL	PROJECTED COST	PROGESS TO DATE	ACTUAL COST
Invasive Species Control	30 acres	$15,000	12.5 acres	$11,417.00
Reforestation: Contiguous Forest	85 acres	$85,000	22 acres	$21,000.00
Invasive Species Control (HWA)	0	0	66 acres	$21,137.50
	TOTAL:	**$100,000**		$43,554.50

The actual cost per acre for invasive species control seems higher than projected only because one of the projects involved (McDowell & Boyer) included invasive plant monitoring and restoration of native plant communities in the project cost.

We have approved projects to treat groves of hemlock trees for hemlock woolly adelgid on two properties having mountain mature forest. These trees are an important part of the forest, functioning to stabilize stream banks, reduce water temperature, and provide habitat for associated rare species including the ostrich fern, the smoky shrew, and the six aquatic species listed under Project A.

Project E. Restoration of Subterranean Habitats

Objective: To provide technical and financial assistance to landowners to restore and protect land adjacent to, and containing, subterranean habitats, using the following practices:

Practice	GOAL	PROJECTED COST	PROGESS TO DATE	ACTUAL COST
Reforestation of Contiguous Forest	50 acres	$50,000	0	0
Grassland Buffers	100 acres	$40,000	0	0
Livestock Exclusion & Fencing	2500 ft	$7,500	0	0
	TOTAL:	**$97,500**		0

Outreach to landowners having caves on their properties will begin soon.

Project F. Restoration of Fens and Seepage Wetlands

Objective: Provide technical and financial assistance to landowners to restore habitat for the federally threatened bog turtle and other fen/seepage wetland species at risk, by applying the following practices:

Practice	GOAL	PROJECTED COST	PROGESS TO DATE	ACTUAL COST
Vegetation Management: Early successional habitat	30 acres	$45,000	20 acres (prescribed grazing)	$4,782.50
Grassland Buffers	50 acres	$20,000	0	0

Invasive Species Control	30 acres	$15,000	7.5 acres	$4,325.00
Livestock Exclusion & Fencing	3750 ft	$11,250	4400 ft	$32,900.00
Restoration of wetland hydrology	0	0	12 acres	$45,000.00
	TOTAL:	**$91,250**		$87,007.50

Our goals and costs for vegetation management in this habitat have been modified somewhat by the amendment of prescribed grazing for bog turtle wetlands into our grant agreement. This has reduced the per acre cost for vegetation management (we are currently averaging about $239/acre in contrast to our projected average of $1,500/acre in this sensitive habitat). However, fencing in these wetlands is quite a lot more expensive due to the nature of the wetland and the requirements of goats (e.g. high-tensile, electrified fence). We amended a new projected cost of $9/ft for wetland fencing into our Tier 2 agreement; currently we are averaging about $7.50/ft. So far, the results of prescribed grazing have already been striking. For example, on the Carney property approximately 0.3 acres of invasive species and woody vegetation was removed in just 6 days of grazing (see Figure 1).

We have also found that for two projects, involving a bog turtle wetland (Zodhaites), and a rare Coastal Plain Fen (Sylvan View Community Association), restoration of hydrology is necessary to restore the conditions required to support species at risk. In the case of Sylvan View, this involved removing and trucking out more than 450 cubic yards of waste soil that had been dumped into the area during past developments – a very expensive procedure.
The species targeted to benefit from these projects are primarily the bog turtle, a federally endangered species, as well as three rare plant species: giant cane, leatherleaf, and brown-fruited rush.

Figure 1: The Carney Property before (left) and after 6 days of vegetation management by prescribed grazing (photos by Linh Phu).

Project G. Restoration of Calcareous Woodlands

Objective: To provide technical and financial assistance to landowners to restore calcareous woodlands using the following practices:

Practice	GOAL	PROJECTED COST	PROGESS TO DATE	ACTUAL COST
Grassland/Forest Buffers	35 acres	$35,000	0	0
Invasive Species Control	30 acres	$15,000	0	0
	TOTAL:	**$50,000**		0

Calcareous woodlands are an extremely rare habitat type in Maryland, ranked S1. There are only four landowners known to have this habitat type on their property – we have contacted all four by letter, and have had one landowner express interest in a LIP project involving approximately 5 acres invasive species control and 8 acres reforestation to buffer the intact Calcareous woodland. We are awaiting the landowner's feedback.

Project H. Restoration of Coastal Plain Mature Forest

Objective: To provide technical and financial assistance to landowners in restoring mature forest habitat for Delmarva fox squirrel and other species at risk, and controlling invasive species in forests of the Coastal Plain of Maryland. LIP projects will include the following practices:

Practice	GOAL	PROJECTED COST	PROGESS TO DATE	ACTUAL COST
Reforestation of Contiguous Forest	125 acres	$125,000	16.5 acres	$8,389.28
Invasive Species Control	15 acres	$7,500	836 acres	$33,413.00
Vegetation management: Understory thinning	28 acres	$14,000	0	0
Invasive Species Control (HWA)	0	0	38 acres	$28,000.00
	TOTAL:	**$146,500**		$69,802.28

We have far outdone our goal for invasive species control mainly through the funding of our first landowner project, a unique capacity-building grant with the American Chestnut Land Trust to enable them to develop and implement their own long-term invasive plant control program on a watershed scale. They are doing this by recruiting and training dedicated volunteers to find, map and remove populations of invasive plants. So far these volunteers have contributed over 450 hours of work towards in-kind match for the grant. This work is to benefit several rare plant species on the property that are known to be susceptible to out-competition by invasive weeds, including few-flowered tick-trefoil, showy goldenrod, long-beaked arrowhead and large-seeded forget-me-not.

We have also approved projects on 4 properties with Coastal Plain hemlock forests, a rare (S2) community type, to treat the hemlocks with imidacloprid in order to control hemlock woolly adelgid. We have an agreement with the Maryland Department of Agriculture (MDA) to treat the trees, and they successfully treated two properties in the mountain region. We have been unable to have the Coastal Plain hemlocks treated as yet due to the recent finding in Maryland of emerald ash borer, another non-native insect, which is occupying MDA's crews. We have completed pre-treatment surveys for HWA on all four properties, and confirmed that trees on all four show evidence of the insect. Unfortunately, treatment with imidacloprid is very expensive, particularly when the chemical is injected directly into tree trunks, which is necessary when trees are close to streams. We are hopeful that treatment will occur on at least two of these properties (The Nature Conservancy – Hellen Creek, and Cove Point Natural Heritage Trust) this fall.

We originally planned to do understory thinning to improve habitat for the federally threatened Delmarva fox squirrel. However, we have found that this procedure is often very expensive, with the benefits to the squirrels debatable. Instead we have focused on the creation of corridors between known fox squirrel populations, and have already planted one 8 acre tree corridor (Malkus) to facilitate fox squirrel movement.

Project I. Restoration of Groundwater-Interfacing Wetlands

Objective: To provide technical and financial assistance to landowners to restore Coastal Plain wetlands, including Delmarva bays, using the following practices:

Practice	GOAL	PROJECTED COST	PROGESS TO DATE	ACTUAL COST
Reforestation: Forested Buffers	5 acres	$5,000	0	0
Invasive Species Control	8 acres	$4,000	330 acres	$20,063.00
Vegetation Management	29 acres	$43,500	52 acres	$8,800.00
Restoration of wetland hydrology	10 acres	$10,000	0	0
Livestock Exclusion & Fencing	$3/foot	$4,200	0	0
	TOTAL:	**$66,700**		$28,863.00

We have already surpassed our goal for invasive species control through our project with The Nature Conservancy to control invasive plant species on a large property containing several natural and newly restored Delmarva bays. This funding includes work to monitor and document changes in plant populations. Another TNC project will help to maintain early successional conditions on 52 acres at the Dorchester Pond Preserve. The cost of this work averages out to $169/acre - more than our projected $25/acre for prescribed burning - because the project also includes funds for fire break maintenance, monitoring of rare plant communities, and equipment to help build capacity for The Nature Conservancy to undertake prescribed burns on this and two other exceptional properties. Together these two projects will benefit several rare species that rely on the Delmarva bay habitat, including Harper's fimbristylis (a G2 species), featherfoil, brown-fruited rush and Small's yelloweyed-grass.

Project J. Restoration of Bald-Cypress and Atlantic White-Cedar Swamps

Objective: To provide technical and financial assistance to landowners in restoration of bald-cypress and Atlantic white-cedar swamps in floodplains of Coastal Plain streams and rivers using the following practices:

Practice	GOAL	PROJECTED COST	PROGESS TO DATE	ACTUAL COST
Reforestation of Contiguous Forest	20 acres	$20,000	0	0
Invasive Species Control	10 acres	$5,000	0	0
	TOTAL:	**$25,000**		0

Landowner outreach for this project is just beginning, and is complicated by the difficult task of finding out exactly where these swamps were located historically.

Project K. Restoration of Xeric Sand Ridges and Patuxent Microdeserts

Objectives: To restore forest communities associated with xeric sand ridges on the eastern shore of Chesapeake Bay, and native plant and arthropod communities associated with microdesert habitats adjacent to the Patuxent River, using the following practices:

Practice	GOAL	PROJECTED COST	PROGESS TO DATE	ACTUAL COST
Reforestation of Contiguous Forest	20 acres	$20,000	0	0
Native plant community restoration	100 acres	$20,000	25 acres	$7,500.00
Invasive Species Control	10 acres	$5,000	25 acres	$12,500.00
Vegetation management – prescribed burn	0	0	100 acres	$20,000.00
	TOTAL:	**$45,000**		$40,000.00

We have surpassed our goal for invasive species control and reached 25% of our goal for native plant community restoration through a project with Behnke's Nursery, on the banks of the Patuxent River, to restore Patuxent Microdesert communities there. The per acre cost for native plant restoration for this project is higher than our projected $200/acre due to the incorporation into the project of research to find native species which can perform the erosion-control function for which the non-native, invasive lespedeza was originally planted. The $20,000 for prescribed burning of 100 acres of xeric sand ridge community owned by The Nature Conservancy is part of their capacity-building LIP grant. These projects will help maintain the open, sandy habitat required by the specialized species that depend on them, such as tiger beetles, hairy snoutbean, Leonard's skullcap and Curtiss' three-awn.

Project L. Restoration of Contiguous Grasslands

Objectives: To restore contiguous native grasslands or savannas historically associated with serpentine soils, barrens, or glades, or anthropogenic grasslands (e.g., hayfields, reclaimed surface mines) using the following practices:

Practice	GOAL	PROJECTED COST	PROGESS TO DATE	ACTUAL COST
Establishment of warm-season grassland	100 acres	$40,000	96 acres	$38,400.00
Vegetation management – grassland thinning	0	0	50 acres	$2,000.00
Vegetation management – early successional habitat	0	0	33 acres	$6,567.00
	TOTAL:	**$40,000**		$46,967.00

We have learned that there is a great need, especially on the Eastern shore, to restore overly thick warm-season grasslands through thinning practices like mowing and disking; and so we have added this practice for this habitat type. Grasslands that were established through CREP or other Farm Bill programs often become neglected and too thick to be good nesting habitat for rare grassland birds after the landowner contract expires. One of our recently approved projects, with the Jean Ellen Dupont Shehan Audubon Center, will fund management of 50 acres of grasslands established in the late 1990s, to help create optimal habitat for rare grassland birds such as vesper sparrows, savannah sparrows, and the eastern meadowlark.

One of our projects (The Nature Conservancy – Prescribed Burn), will restore 33 acres of serpentine barren habitat (a highly rare habitat type in Maryland, ranked S1) by using prescribed burns to manage encroaching woody vegetation.

Additional Project: Restoring Beaches for Northeastern Beach Tiger Beetles

In addition to the projects listed above, and specified in our grant agreement, we have worked on 7 properties to restore sandy beach habitat for the federally endangered Northeastern Beach Tiger Beetle. This involves removing the non-native grass *Phragmites* on approximately 2 acres of beach at Drum Point, Calvert County. So far we have completed one round of treatment with encouraging results (seeFigure 2), and will complete another round of herbicide treatment this year. $12,000 in LIP funds have been encumbered for this project, but this may be an overestimate depending on the number of treatments required to fully remove the *Phragmites* populations.

Figure 2: *Phragmites* stand on the beach in October 2006 (left) and June 2007, after treatment (right).

QUANTIFIED OUTCOMES

Total number of acres of wetlands under agreement to be improved, managed or restored: 456.5

Cost: $202,125.57 (~ $442/acre)

Total number of non-wetland acres under agreement to be improved, managed or restored: 1452

Cost: $320,579.78 (~$220/acre)

TOTAL COST: $522,705.35

SECTION 7 REVIEW SUMMARY

We have completed Section 7 reviews for 25 of our 29 landowner projects. Of these, 12 properties have no known occurrences of federally listed species. The remaining 13 are as follows:

Project(s)	Species	Determination
ACLT	Bald eagle	**No effect**
Carney Seitz	Bog turtle	**Not likely to adversely affect**– see note below
Denner	Bog turtle	**Not likely to adversely affect** - project will follow closely all the recommendations of the Biological Opinion, which states that if this is done the risk of take resulting from invasive species removal is “discountable” and is extremely unlikely

Project(s)	Species	Determination
Dewling Felsen Gibson Gribble Zeiller Lee Drum Point Project, Inc.	Northeastern Beach Tiger Beetle	**Not likely to adversely affect** – chemical application is occurring when adult beetles are absent
Malkus	Delmarva fox squirrel	**No effect** - planting activities will not involve any direct disturbance to the mature forest stands where the squirrels live, and will impact only land that is currently planted with grass
Pickering Creek Audubon	Delmarva fox squirrel	**Not likely to adversely affect** - although imidacloprid may be moderately toxic to mammals through direct ingestion, the limited application of the insecticide into soil directly below hemlock trees or into the trunk will eliminate the possibility of ingestion by Delmarva fox squirrels.

For the Carney and Seitz prescribed grazing projects, we received concurrence from the Chesapeake Bay Field Office of the USFWS that the fencing and grazing practices are not likely to adversely affect the bog turtle, and therefore these projects were approved and deemed exempt from the terms of the bog turtle Biological Opinion issued in March of 2006.

APPENDIX 1: Species that stand to benefit from MD LIP projects

Common Name	Scientific Name	Type	Global rank	State rank	Project(s) where benefits
Carpenter Frog	*Rana virgatipes*	amphibian	G5	S2	TNC - Jackson Lane
Henslow's Sparrow	*Ammodramus henslowii*	bird	G	S1S2	Rock Lodge Trust
Grasshopper sparrow	*Ammodramus savannarum*	bird	G5	GCN	JEDS Audubon, Rogers
Northern harrier	*Circus cyaneus*	bird	G5	S2B	JEDS Audubon
Northern bobwhite	*Colinus virginianus*	bird	G5	GCN	JEDS Audubon, Rogers
Prairie warbler	*Dendroica discolor*	bird	G5	GCN	Rogers
Willow flycatcher	*Empidonax traillii*	bird	G5	GCN	Rogers
Worm-eating warbler	*Helmitheros vermivorus*	bird	G5	GCN	Rogers
Laughing gull	*Larus atricilla*	bird	G5	S1B	JEDS Audubon
Kentucky warbler	*Oporornis formosus*	bird	G5	GCN	Rogers
Savannah sparrow	*Passerculus sandwichensis*	bird	G5	S3S4B	JEDS Audubon
Pied-billed grebe	*Podilymbus podiceps*	bird	G5	S2B	JEDS Audubon, TNC - Prescribed Burn
Vesper sparrow	*Pooecetes gramineus*	bird	G5	S3S4B	Rogers, JEDS Audubon
Louisiana waterthrush	*Seiurus motacilla*	bird	G5	GCN	Rogers
Dickcissel	*Spiza americana*	bird	G5	S2B	Rogers, JEDS Audubon
Field sparrow	*Spizella pusilla*	bird	G5	GCN	Rogers, JEDS Audubon
Least tern	*Sterna antillarum*	bird	G4	S2B	JEDS Audubon
Royal Tern	*Sterna caspia*	bird	G5	S1B	JEDS Audubon
Eastern meadowlark	*Sturnella magna*	bird	G5	GCN	Rogers, JEDS Audubon
Blue-winged warbler	*Vermivora pinus*	bird	G5	GCN	Rogers
Comely Shiner	*Notropis bifrenatus*	fish	G5	SH	Broad Cr. Scouts
Logperch	*Percina caprodes*	fish	G5	S1S2	Broad Cr. Scouts
Shield Darter	*Percina peltata*	fish	G5	S3	Broad Cr. Scouts
Brook Trout	*Salvelinus fontinalis*	fish	G5	S3S4	Broad Cr. Scouts, Zodhaites
Northeaster beach tiger beetle	*Cicindela dorsalis dorsalis*	insect	G4T2	S1	Drum Point Project, Inc., Felsen, Gribble, Lee, Gibson, Zeiller, Dewling
Tiger beetle	*Cicindela scutellaris rugifrons*	insect	G5	S3	Behnke's Nursery
Delmarva Fox Squirrel	*Sciurus niger cinereus*	mammal	G5T3	S1	Malkus
Smoky Shrew	*Sorex fumeus*	mammal	G5	S2S3	Broad Cr. Scouts
Green Floater	*Lasmigona subviridis*	mollusc	G3	S1	TNC - Licking Cr.
Squawfoot	*Strophitus undulatus*	mollusc	G5	S2	TNC - Licking Cr.
Coastal Plain Hemlock Community		nat. comm.	G3?	S2	Cove Pt. NHT, Koste, Pickering Cr. Audubon, TNC - Hellen Cr.
Delmarva Bay Glade		nat. comm.	GNR	S1?	TNC - Jackson Lane
Delmarva Bay Woodland		nat. comm.	GNR	S1?	TNC - Jackson Lane
Delmarva bay		nat. comm.	GNR	S2	TNC - Jackson Lane, TNC - Prescribed Burn
Serpentine Barren		nat. comm.	GNR	S1	TNC - Prescribed Burn
Xeric sand ridge		nat. comm.	GNR	?	TNC - Prescribed Burn
Curtiss' three-awn	*Aristica curtissii*	plant	G5	SU	TNC - Prescribed Burn
Giant Cane	*Arundinaria gigantea*	plant	G5	S2	Sylvan View Comm.
Serpentine aster	*Aster depauperatus*	plant	G2	S1	TNC - Prescribed Burn

Common Name	Scientific Name	Type	Global rank	State rank	Project(s) where benefits
Aster-like Boltonia	*Boltonia asteroides*	plant	G5	S1	TNC - Jackson Lane
Hop-like Sedge	*Carex lupuliformis*	plant	G4	S1?	TNC - Jackson Lane
Leatherleaf	*Chamaedaphne calyculata*	plant	G5	S1	NGB
Few-flowered Tick-trefoil	*Desmodium pauciflorum*	plant	G5	S1	ACLT
Stiff tick-trefoil	*Desmodium strictum*	plant	G4	S1	TNC - Prescribed Burn
Glade fern	*Diplazium pycnocarpon*	plant	G5	S2	Weitzell
Robbins' spikerush	*Eleocharis robbinsii*	plant	G4G5	S1	TNC - Prescribed Burn
big-topped lovegrass	*Eragrostis hirsuta*	plant	G5	S1S2	TNC - Prescribed Burn
Parker's pipewort	*Eriocaulon parkeri*	plant	G3	S2	TNC - Prescribed Burn
Harper's Fimbristylis	*Fimbristylis perpusilla*	plant	G2	S2	TNC - Jackson Lane
Featherfoil	*Hottonia inflata*	plant	G4	S1	TNC - Jackson Lane
Creeping St. John's-wort	*Hypericum adpressum*	plant	G3	S1	TNC - Prescribed Burn
Coppery St. John's-wort	*Hypericum denticulatum*	plant	G5	S2	TNC - Jackson Lane
Brown-fruited rush	*Juncus pelocarpus*	plant	G5	S1	Sylvan View Comm., TNC - Prescribed Burn
Red-root	*Lachnanthes carolineana*	plant	G4	S1	TNC - Prescribed Burn
Ostrich Fern	*Matteuccia struthiopteris*	plant	G5	S2	Broad Creek Scouts
Large-seeded Forget-me-not	*Myosotis macrosperma*	plant	G5	S2S3	ACLT
Cross-leaved milkwort	*Polygala cruciata*	plant	G5	S2	TNC - Prescribed Burn
Torrey's mountain-mint	*Pycnanthemum torrei*	plant	G2	S1	TNC - Prescribed Burn
Drowned hornedrush	*Rhynchospora inundata*	plant	G3G4	S1	TNC - Prescribed Burn
Long-beaked baldrush	*Rhynchospora scirpoides*	plant	G4	S2	TNC - Prescribed Burn
Hairy snoutbean	*Rhynchospora tomentosa*	plant	G5	S2	TNC - Prescribed Burn
Long-beaked Arrowhead	*Sagittaria longirostra*	plant	GNRQ	SU	ACLT
Reticulated nutrush	*Scleria reticularis*	plant	G4	S2	TNC - Prescribed Burn
Leonard's skullcap	*Scutellaria leonardii*	plant	G4T4	S2	TNC - Prescribed Burn
Showy Goldenrod	*Solidago speciosa*	plant	G5	S2	ACLT
Northern dropseed	*Sporobolus heterolepis*	plant	G5	S1	TNC - Prescribed Burn
Featherbells	*Stenanthium gramineum*	plant	G4G5	S1	TNC - Prescribed Burn
Fameflower	*Talinum teretifolium*	plant	G4	S1	TNC - Prescribed Burn
Snow Trillium	*Trillium rivale*	plant	G4G5	S1	Rock Lodge Trust
Purple bladderwort	*Utricularia purpurea*	plant	G5	S1	TNC - Prescribed Burn
Reversed bladderwort	*Utricularia resupinata*	plant	G4	S1	TNC - Prescribed Burn
Small's yelloweyed-grass	*Xyris smalliana*	plant	G5	S1	TNC - Prescribed Burn
Spotted turtle	*Clemmys guttata*	reptile	G5	GCN	JEDS Audubon
Bog Turtle	*Clemmys muhlenbergii*	reptile	G3	S2	Carney, Denner, Seitz, Zodhiates